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BLACK LOCUST



Black locust, one of the heaviest woods grown commercially in the United States, is rated high in durability, strength, shock resistance, hardness, and nail-holding ability. The wood turns well in a lathe but is difficult to work with hand tools. Its durability under conditions favorable to decay makes black locust ideal for fence posts. It has further but limited use as mine timbers, insulator pins, and treenails for ship construction.

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BLACK LOCUST

(*Robinia pseudoacacia* L.)

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DISTRIBUTION

Black locust is native to the Appalachian Mountains from Pennsylvania to northern Georgia and Alabama and to the Ozark Mountains of southern Missouri, Arkansas, and eastern Oklahoma. It is also found in southern Illinois and Indiana (fig. 1).

This species has been extensively naturalized in the eastern half of the United States—west and south from Maine—and in southern Canada. In Oregon and other far western states, where it was introduced for use as fence posts, it has escaped from cultivation.

Cover: F-310010

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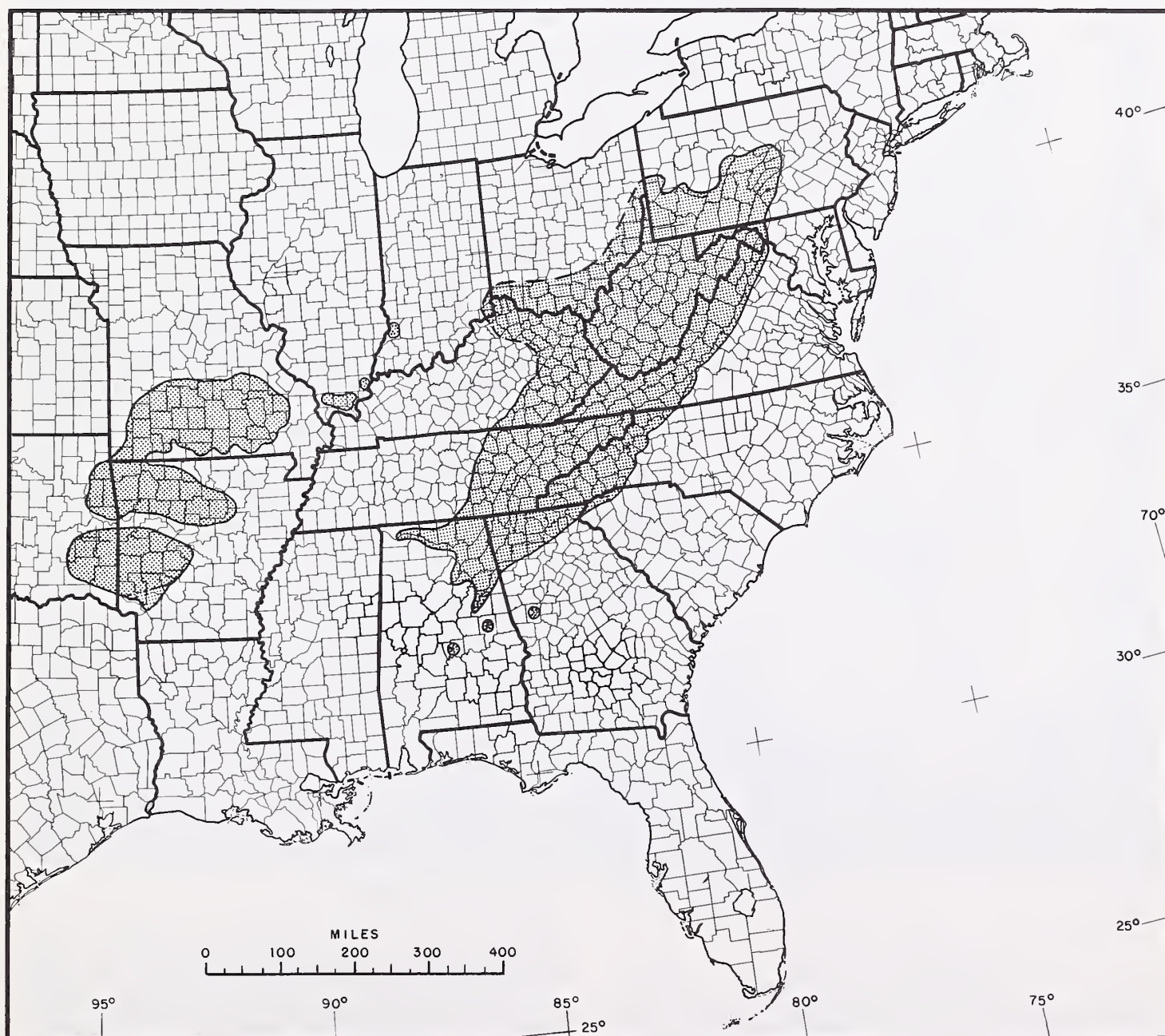


Figure 1.—The range of black locust, *Robinia pseudoacacia* L.

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Within its original natural range, black locust generally occurs below 3,500 feet elevation in association with black oak, red oak, chestnut oak, pignut hickory, yellow-poplar, and maple. Along streams it is found with ash, maple, and black walnut. In the western part of the Appalachian Mountains it grows in association with the various hard pines such as pitch pine, short-leaf pine, Table-Mountain pine, and Virginia pine. The species shows its best development in West Virginia.

DESCRIPTION AND GROWTH

Black locust grows to a height of 40 to 100 feet and a diameter of 1 to 3 feet. The stem is generally straight and clear in a forest stand, but in the open it is likely to fork and become limby (see cover).

Black locust is characterized by the paired sharp spines or stipules about one-half inch long that develop at the base of each leaf. Leaves are compound-pinnate, 8 to 14 inches long, with seven to 23 leaflets. The oval leaflets are 1 to 2 inches long and end in a minute sharp point. The white to pink flower clusters, 4 to 5 inches long, appear in the spring and have a heavy fragrance that is quite pleasant (fig. 2). The flat brown seed pods, a half-inch wide and 2 to 4 inches long, mature in the fall. Bark of the mature tree is brownish-gray, thick, and deeply furrowed into forked ridges (fig. 3).

Black locust attains best growth on sites without a pronounced subsoil. Limestone base soils are especially favorable. The tree is intolerant of shade and is seldom found in dense forests except as a dominant tree. When it has room to become established, its rapid growth enables it to compete successfully with the more tolerant species.

Black locust stands encroach on farmlands and burned-over areas by root suckering. These suckers appear in the fourth or fifth year of growth. Heavy crops of seed are produced, normally at 2-year intervals, but natural reproduction is primarily by root suckers because the heavy, impermeable seed coat restricts germination. Injury to the parent plant or disturbing the root system increases both the number and vigor of suckers. Sprouts can be controlled effectively by herbicides.

One variety has been recognized; namely, shipmast locust (*Robinia pseudoacacia* var. *rectissima* Raber), originally discovered on Long Island, N.Y., in the midthirties and since found throughout New England. This variety is a poor seed producer and propagates almost entirely by vegetative means. It differs from the typical species in having a straighter stem, greater resistance to attack by borers, and greater resistance to decay. Plantations of shipmast locust grown in the Central States do not have the desirable characteristics of the species grown in New England.

COMMON NAMES

Black locust is the name commonly used, but the species is also called yellow locust, locust, post locust, and shipmast locust.

RELATED COMMERCIAL SPECIES

The other species of *Robinia* which occur in the United States are not commercially important. The only other arborescent is clammy locust (*Robinia viscosa* Vent.). Clammy locust is widely planted as an ornamental. The wood is not distinguishable in trade from that of black locust.

SUPPLY

The total supply available in the forest inventory seems adequate to meet future demands. Inventory of the supply of black locust in 21 States, made between 1953 and 1965, totaled 495.6 million cubic feet. North Carolina, Virginia, Pennsylvania, and Kentucky were leading producers and collectively provided approximately 70 percent of the indicated supply. Tennessee and Maryland accounted for an additional 17.5 percent.

PRODUCTION

Generally black locust should be cut at an early age (20 to 30 years) since trees mature early. The locust borer (*Megacyllene robiniae*) often attacks the tree; this weakens the tree and makes it unfit for most commercial uses. A secondary attack by heart rot (*Fomes rimosus*) is usually fatal to trees already weakened by borer attack.

Production of black locust fluctuates considerably, but the general trend is decreasing because many uses of the wood are being lost to competing materials. In 1960 about 2.3 million board feet of black locust was used in all manufacturing industries. This was approximately one-half of the amount used in 1940 and about one-fourth of that used in 1928.

Use of black locust lumber in manufacturing in 1960 was mainly in two categories: lumber and wood products (including hardwood dimension and flooring), about 70 percent; and household furniture, about 30 percent.

Most black locust produced today is used for fence posts. Since most of the harvesting and marketing of these posts is done by small operators who sell directly to consumers, figures for production are only rough estimates. Production of fence posts in nine states where this industry is important was estimated in the years 1961 through 1965. West Virginia led, with 1,315,000; Kentucky was second with 1,100,000; all others combined totaled 1,290,000.

CHARACTERISTICS AND PROPERTIES

The outstanding characteristic of black locust is the durability of its heartwood when used under conditions favorable to decay. The wood is quite heavy; density at 15-percent moisture content is 49 pounds per cubic foot. Despite its high density, the wood has moderately small shrinkage and stays in place well. It is exceedingly strong in bending; its modulus of elasticity is more than two million p.s.i. It is one of the



Figure 2.—Leaves and flowers of black locust.

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hardest American woods. Its shock resistance is quite high but does not equal that of the true hickories.

The heartwood of black locust, when freshly cut, varies in color from greenish-yellow to dark brown. It turns to a dark russet brown after exposure to air. The narrow sapwood is a creamy white. The wood

is often confused with that of Osage-orange (*Maclura pomifera*). However, shavings of Osage-orange placed in water leach a yellow dye but black locust shavings do not. Another positive means of separation is the presence of vestured intervessel pits, which do not occur in Osage-orange.



Figure 3.—Bark of black locust. F-236611

The wood turns well in a lathe but is rather difficult to work with hand tools. It holds nails well, and it has no distinct taste or odor.

Large, clear, straight-grained pieces are not common since the trees are frequently limby and crooked. The wood usually contains holes made by borers, as well as knots and cross-grain. Bird pecks cause discoloration of the wood but do not affect it otherwise.

PRINCIPAL USES

Black locust trees have been planted extensively on land strip-mined for coal because they survive better on the acid spoil banks than any native species. The extensive root system and the nitrogen-fixing capability of this member of the *Leguminosae* aid in reclaiming the land and in preventing erosion. In addition, black locust has been rated superior in developing wildlife habitat on wasteland.

Black locust wood can be used wherever durability, strength, and dimensional stability are important. It is a preferred wood for farm fencing because of its natural durability and nail-holding ability. In recent years, though, much of this market has been captured by dependable supplies of treated pine posts.

Great quantities were formerly used in manufacturing insulator pins, but increasing use of underground cable and the development of a suitable steel insulator pin have greatly reduced this market.

Black locust is used in manufacturing some domestic furniture, but this use is limited by lack of depend-

able supplies of high grade material, the weight of the wood, and the difficulty of working it with hand tools. It has limited use for mine timbers and for treenails in ship construction.

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